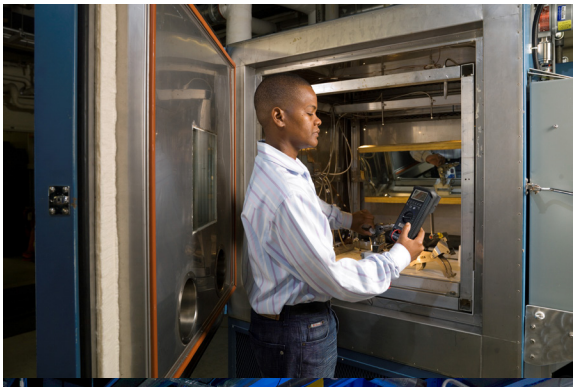
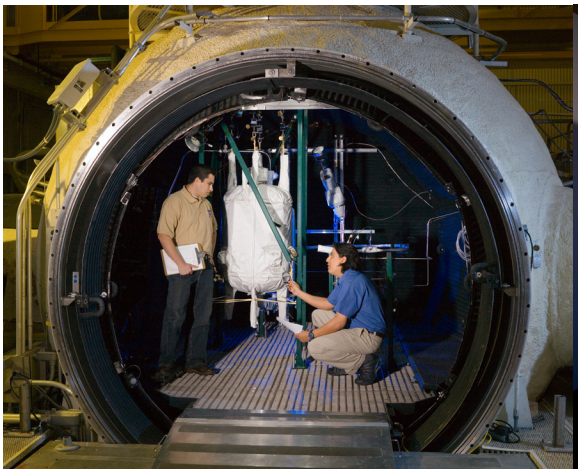
# Thermal Testing

Johnson Space Center (JSC) thermal test facilities offer a wide range of performance capability, which can be matched to the individual test requirements of smaller test articles or large test article components and subsystems. Typical uses of these chambers have included development, engineering evaluation, and qualification testing of spacecraft components, subassemblies and experiments, and preflight thermal conditioning of flight hardware.

## Services Provided

- Temperature and humidity cycling
- Accurate determination of design factors
  - Operating temperatures
  - Changes in absorptive or emissive properties of thermal coating
  - Changes in electrical or mechanical properties of materials
- Accelerated electrical or electronic components burn-ins and life-cycle testing
- Environmental cycling (thermal and humidity) for materials survivability
- Battery performance and abuse testing





Johnson Space Center

## Structural Test Facilities

| Facility | Size | Temperature Range | Features |
|---|---|---|---|
| Thermotron | 24″ H x 24″ W x 24″ L | -90 – 350 °F | Used for engineering evaluation thermal testing of avionics hardware |
| Chamber H | 8′ H x 8′ W x 15′ L | -150 – 200 °F | Two observation windows and glove ports are available for test article access. |
| Chamber K | 3′ H x 3′ W x 3′ L | -250 – 350 °F | Programmed for any temperature profile desired with variable soak times and rates of temperature change. An observation window and glove ports are available for test article access. |
| Chamber L | 3′ H x 3′ W x 3′ L | 20 – 200 °F | Used to control temperature and humidity (30 – 98% range). Microprocessor-controlled profiles can be input to define the range of temperature and humidity conditions. |
| Chamber T | 27″ H x 27″ W x 29 ¾″ L | -250 – 350 °F | Can be programmed to automatically control temperature and rate of change between temperature extremes. An observation window and glove ports are available for test article access. |
| 8-Cubic-Foot Chamber | 24″ x 24″ x 24″ | -100 – 300 °F | 24” access with 3” access ports |
| 32-Cubic-Foot Chamber | 38″ x 38″ x 38″ | -100 – 300 °F | Glove Door and 38” access with 3” access ports |
| Sun Thermal Chamber | 22″ H x 22″ W x 22″ L | -300 – 600 °F | Programmable temperature enclose with 3” access ports and a glove box with door and window |
| 3-Foot Thermal Box | 3′ H x 3′ W x 3′ L | -100 – 375 °F | Temperature and humidity chamber with observation window and access ports |
| Chamber E | 4.6′ Dia x 9.5′ L | -280 °F – * | Thermal-vacuum chamber equipped with cold walls and pumping system suitable for trace-contaminant testing |
| Chamber N | 3′ Dia x 3′ L | -280 °F – * | Thermal-vacuum chamber with linear and rotary feed-throughs to facilitate operational testing of spaceflight components |
| Chamber P | 5′ Dia x 4′ L | Ambient – 400 °F | Thermal-vacuum chamber with heated shrouds used primarily for hardware bakeouts |
| O2 Effects Chamber | 2′ Dia x 36″ L | -250 – 350 °F | Enriched oxygen atmosphere for materials compatibility testing |
| 15-Foot Chamber | 12.5′ diameter | -300 – 300 °F | Thermal-vacuum chamber with multi-gas usage, solar and night radiation, and wind |

* Maximum temperature is dependent on characteristics of the test article and associated test buildup

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For the benefit of all

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